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P. P. CLAXTON, *Commissioner.*

CERTAIN DEFECTS IN AMERICAN EDUCATION AND THE REMEDIES FOR THEM.

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The war with Germany has presented to the American people much new evidence concerning the grave defects in their own physical and mental condition and therefore, presumably, in their training and education during at least two generations past. To study the remedies for the defects disclosed by our attempts to recruit quickly a great Army and a great Navy, and simultaneously to man our war industries with as large a number of competent mechanics and operatives, is the most urgent duty of all institutions and persons who possess any of the elements of educational leadership. Especially is it the duty of American universities, colleges, technical institutes, school boards, and normal schools to study the changes in the elementary and secondary schools of the country needed in order to remedy in the rising generations the physical and mental defects from which their predecessors have suffered. That study should lead, first, to a clear understanding of those defects, and, second, to an intelligent prescription of the appropriate remedies. To apply the remedies is the duty of legislatures, school boards, and educational administrators all over the country.

PHYSICAL DEFECTS.

1. *In school children and drafted men.*—The sporadic medical inspections of school children and the medical examinations of young men drafted for the National Army have revealed in children and in young men between 21 and 31 a large percentage of serious bodily defects, which in many cases impair the capacity of the children to work efficiently in school and of the young men to serve satisfactorily in the Army or Navy. The percentage of defective bodies in both school children and young men drafted for military and naval service has surprised and mortified the American public. It is some consolation that many of the defects and disorders in the school children are remediable, but thus far the organization and enforcement of remedial processes are by no means sufficiently general to cope with the existing evil. Most of the attempts at remedy are municipal only. The Nation and the States have not yet attacked the grave problem in earnest.

The remedy.—The remedies for the large percentage of abnormal and diseased school children and young men of the draft age are of course medical, including all the agencies grouped under the head of preventive medicine and public health. The medical examiner,

the school nurse, and the district nurse should be regular members of every school system in the country, rural as well as urban, and their work should go on incessantly, not for a few days out of the year, but all through the year. The first duty of these permanent officials should be the detection of defects and diseases, but their principal function should be following up the children to their homes and instructing their parents as to remedial action. Since it will not be possible to obtain permanent improvement in society as a whole in respect to the bodily defects of children and adolescents until the whole community has been enlightened in regard to nutrition, housing, community cleanliness, and the medical means of controlling epidemics and resisting the spread of venereal diseases, this medical instruction, to be given through physicians and nurses employed at public expense, is the most legitimate kind of public instruction in a democracy become heterogeneous. The expenditure involved is necessary to the accomplishment of an indispensable reform. The beginning should be made at once, and the National, State, and municipal governments should all take part in the work. Within the schools themselves many improvements in the classification and promotion of pupils can be based on the reports of the physicians and nurses.

2. *Bad diet.*—The studies of the American and European food supplies, which the war has forced on all the nations involved, have brought into clear relief the fact that the diet of the American people as a whole has been extremely wasteful and badly selected as regards its chemical constituents. All classes, the poorest as well as the richest, have erred habitually in respect to both the quantity and the quality of their food.

The remedy.—The remedy for the bad diet of the American people as a whole will be found in the addition to the program of every school in the country of so much instruction in chemistry, physics, and biology as is necessary, first, to the comprehension by every pupil of the different elements which make up a complete diet for infant, child, and adult, and secondly, to the mastery by both sexes of the processes of cooking and serving food in wholesome ways. That amount of applied science should be learned by every boy and girl in every American school before the age of 16 years; and no subject, except the English language, should take precedence of that subject.

3. *No systematic physical training.*—There has been no universal physical training for the children and youth of the country on a judicious program everywhere enforced. The American schools, both elementary and secondary, have neglected this important element in the training of the children; and the increasing urban population has had no opportunity of remedying this defectof the schools, through well-organized play and out-of-door sports or exercises. Children brought up in the country have of course had more chances than city children to compensate the defects of their schools as regards physical training. Looking on at ball games is not physical training and the real participants in such exercises are few.

The remedy.—To secure for every child in the country a complete course of physical training is a great national object in war times and peace times alike, and part of the expense of the course should be borne by the National Government. The Swiss Federal Council prescribes the program of physical training for every school in Switzerland, and appoints and pays the national inspectors who see that this

program is carried out. The Federation also makes a small contribution to the cost of this training throughout the Republic. The war with Germany has already taught us that the United States should henceforth and at once do the same thing in aid of the much larger expenditures of the States and the municipalities on the same all-important subject, and should make sure that the training is actually given. When a proper course of physical training has been in operation in the United States for 12 to 15 years, the productiveness of the national industries will show a great increase, and the young men who are to fill the permanent Army and Navy of the United States will come to the annual mobilization with bodies already fit for the work of a soldier or sailor.

4. *Infant mortality.*—Infant mortality throughout the country has been high, and at the same time the birth rate has been falling.

The remedy.—The shocking waste of infant life which now prevails throughout the country can be prevented only through the improvement of the public health service, and the diffusion of knowledge of the elements of personal and community hygiene throughout all classes of society. Every secondary school in the country should recognize its duty to give this instruction, and should perform it under National and State inspection. Every industrial corporation which employs married women should so conduct its labor turn-over as to provide substitutes for their married women during two months before and two months after confinement. Indeed, the probability is that American women would profit greatly in health and fecundity if the rule said to be in force in the Greek colonies in the United States could be applied to them also—no employment in indoor machinery industries after marriage. To reduce present infant mortality it is indispensable that the mothers should have time to take care of their babies, and should know how to do it. Moreover, the National Government should utilize the present emergency to insist that the public registration of births, deaths, and diseases should be made obligatory all over the United States. In large areas of the United States there is at present no registration at all of this sort.

5. *Tuberculosis.*—In most parts of the country, Government—National, State, and municipal—has only just begun to take the first steps in the campaign against the ravages of tuberculosis. The pioneering work in this conflict has been done altogether by private organizations; and although these private efforts have already proved the possibility of greatly reducing the mortality from this scourge and its interference with the industrial productiveness of the Nation, the governmental attack upon it is still feeble and scattering.

The remedy.—The means of reducing the mortality from tuberculosis and putting an end to the great reduction of the national productiveness caused by this disease are now well known, having been demonstrated by the medical profession and private philanthropy. Can the democratic community be taught through all its educational agencies to insist that money raised by taxation should be spent, as fast as it can be judiciously applied, in fighting this scourge, which is so destructive among all the nations forced by their climate to live indoors a good part of the year, and especially among congested manufacturing populations? The people of the United States undoubtedly have the money to spend in this way, but they are not spending it. It is for the schools and colleges by their own educational processes to bring the people up to the point of demanding that

expenditure. The elementary and secondary schools ought to give all the biological instruction needed to this end within the regular school programs, and also do something to spread this much-needed knowledge among the parents of the school children and other adults. Success in the conflict with tuberculosis is conditioned on overcoming the general ignorance of the common people on the subject.

6. *Alcoholism.*—The general desire to prosecute the war with vigor has persuaded the American people to take some effective measures against alcoholism, but it is still uncertain how effective the execution of the prohibitory laws will be. It must be generally effective in order to prevent what has been a progressive degradation of the health and energy of the people through the use of alcoholic drinks. It has been already demonstrated, however, that enlisted soldiers and sailors can be in large measure protected from this evil.

The remedy.—It remains to be seen whether the efforts made in Russia and America to abolish the manufacture and sale of distilled liquors, and the attempts made in Great Britain to restrict the sale of such liquors, will have permanent effects toward reducing the hideous evils wrought on these peoples by alcoholism. They are evils transmissible from one generation to another through the birth of diseased, defective, and feeble-minded children, and of children peculiarly susceptible to formidable diseases in later life. Within recent years great progress has been made in knowledge of the effects of alcohol on the human body when used either in moderation or in excess, and this knowledge it is emphatically the duty of the schools and colleges to impart to all their pupils, and to spread throughout the communities in which they are respectively situated. No vested interests and no class privileges should be allowed to interfere with the discharge of this serious public duty.

7. *Venereal diseases.*—A growing desire to protect the population from decay and extinction had induced some of the States, even before the war, to adopt some effective legislative and administrative methods to prevent the spread of the most destructive of all the contagious and transmissible diseases, the venereal diseases. The desire to prosecute the war with vigor has strengthened this tendency. The whole people has been shocked by the revelations which the medical examinations of drafted men have made concerning the prevalence of these destructive diseases in the American communities, both rural and urban. As steps toward military and naval efficiency, wise measures have been taken for the first time in the history of this country to protect, temporarily at least, the soldiers and sailors of the United States; but neither Congress nor the State legislatures have as yet enacted the laws and made the administrative provisions necessary to the defense of the civil population.

The remedy.—Again the vital remedy is educational. In spite of the revelations made during the last 10 years, and particularly during the last 3 years, concerning the prevalence and horrible effects of the venereal diseases among the American people, the schools, colleges, and churches of the country have done practically nothing to direct the attention of pupils, students, and parents to the need of defensive measures against these worst of scourges and to the elements of the defense. So dense is the popular ignorance on this subject that the voters can not be expected to require their representatives to pass the needed legislation, and the legislators themselves have been up to this time unwilling to do so, in spite of the urgency of the larger part

of the medical profession and of most public health officials and heads of hospitals, dispensaries, and penal institutions. To obtain adequate public action for the prevention and treatment of these diseases and for the isolation of contagious cases, is apparently a matter which the educational forces of the country must deal with unanimously and energetically. Not only must all the children and youth of the country be made acquainted with the need of a great public reform in this respect, but they must be taught whatever amounts of chemistry, physics, and biology are needed for a comprehension of the nature of the evils and of the remedies for them. There are many other motives for teaching these scientific subjects adequately in the public schools, but none of them is stronger than this reason. Furthermore, the reform can not be made complete and the community rescued from the progressive physical deterioration which afflicts it unless the educational forces of the community, including the churches, lead the people to a fundamental moral reform, namely, the single standard in regard to chastity—a standard which heretofore has been widely applied to one sex, but only very narrowly to the other. Knowledge, cooperative discipline, and self-control are the ultimate safeguards. The war has taught us that to find and apply the remedy for these horrible evils is a great national interest. It will remain a national interest of the most intense sort when the Great War at last ceases. Every successful effort which the National Government makes in this direction during the war should be continued and developed when peace at last comes, and the same is true of the States and the municipalities. To promote these results is the duty of every educational force in the country, but particularly of the medical profession as public teacher.

THE MENTAL DEFECTS.

8. *Illiteracy.*—The effort to recruit a large Army and Navy by conscription has brought home to the minds of the people the fact reported in the last United States census that 7.7 per cent of the people in the United States 10 years of age and over are illiterates; that is, they are unable to write their own language. The different States of the Union vary widely in this respect, from Iowa with 1.7 per cent to Louisiana with 29 per cent, from the west North Central States with 2.9 per cent to the east South Central with 17.4 per cent. When the fact was announced that the Regular Army of the United States had been obliged to abandon its practice of rejecting all illiterate candidates for admission—a practice to which it had adhered for many years—the American people took notice of the general condition of the country with regard to illiteracy and the special condition of certain States. When it appeared that a considerable percentage of the recruits accepted for the National Army could receive no instruction except by word of mouth, the military and the civil national authorities alike perceived that the so-called system of American education was dependent as to its results on local authorities which were often ignorant and shortsighted, and that neither the Nation nor the State had any effective influence on this all-important matter.

The remedy.—The remedy for the high percentage of illiteracy in the United States is to be found in an increased interest of the State governments and the National Government in public education. It clearly appears that it is not safe to leave to the local authorities of cities, towns, and counties the exclusive charge of the elementary and

seeondary sehools. It is an intense national interest in peace times and war times that all the people should be able to read, and to read the English language. It is for the United States to see to it that all the ehildren of Ameriean, European, Asiatie, or African stoek learn to read, and in the English language. The National Government will probably work through the States, as it has done in regard to instruction in agrieulture and the meehanie arts, and the States will probably not need much new legislation in order to bring an effeetive influenee to bear on eounties and towns. It is for the universities and eolleges of the eountry of all sorts to bring their influenee to bear on public opinion in support of these new measures to extinguish illiteraey in the Ameriean demoeraey. A strong influenee ean be exerted through the College Entranee Examination Board.

9. *No manual skill.*—The keen demand in the Army and Navy and the war industries for men and women possessing some degree of manual skill has brought out the faet more elearly than ever before that the attainment of some skill by each individual pupil has never been proposed to itself as an important objeet by the Ameriean school, whether elementary or seeondary, or by the Ameriean eollege. In most of the large towns and eities of the United States pupils can graduate even from the seeondary schools without having obtained any manual skill whatever in any science or in any art. A few secondary schools in large towns and cities have lately effected some slight improvements in this respeet, but no national movement in this direction has taken place. Most eollege graduates ean not draw, sing, ride, row, play a musical instrument, or use well a scythe, saw, plane, test tube, theodolite, compass, or microseope.

The remedy.—Every school program in the United States should provide at once for the acquisition by every pupil of some kind of ocular and manual skill. There is no such general provision or expeetation now, but the lesson which the war so plainly teaches must not be lost on any of the authorities that eontrol or influence the programs of elementary and secondary schools. The demands of the Navy and Army illustrate this need, but the demands of the industries of the eountry are not less urgent. It is not to be expected or desired that all pupils should acquire the same sort of skill. On the eontrary, variety among the pupils is highly desirable, but it is indispensable that every pupil should aequire some skill. Every girl should learn to sew and to eook, and every boy should learn, when he is strong enough, to use the tools of the earpenter, a mason, and a plumber. Every child, whether girl or boy, should learn meehanieal drawing and the elements of freehand drawing. Instruetion in these subjects should begin in the elementary school and be earried through the secondary school. And, in addition, every child should study the elements of chemistry, physics, and biology in an experimental and eonerete manner, partly for the reasoning of these seienees, of course, but also for the training of the senses which comes through the proper study of them.

10. *Little training of the senses.*—In most Ameriean schools there has been a lack of systematie training of the senses, and little intelligent effort has been made to proeure incessant aetivity on eaeh pupil's part to record, remember, and describe accurately observations made by his own senses. Little systematic training has been given day by day in the proeesses of determining facts and weighing evidence. No systematic, everyday praetiee of aecurate state-

ment in speech and writing has been insisted on. Worst of all, most American schools have neglected to enlist and cultivate assiduously the interest of each pupil in his daily work, in spite of the obvious fact that no human being, child, adolescent, or adult, can do his best work unless he is taking an interest in that work. Hence, American schools have, as a matter of fact, failed to train the great mass of the children for successful earning of a livelihood in the American world of to-day, and at the same time they have failed, for the most part, to inspire the children with the tastes, ambitions, and aspirations which would guide them to a sensible and enjoyable use of their leisure. This is a serious indictment of the American elementary and secondary schools, but if any American now over 30 will look back at his school experience he will probably find that the indictment is true against his own schools and, so far as he can see, against the schools of his contemporaries. In such a study of his own case, he will probably find that for such powers of observation, reasoning, and precise statement as he possesses he is indebted not chiefly to his schools but to his parents, or to some older friend, or to the sports, or work which lay outside of the system of his school, or to the business or profession in which he has earned his living.

11. *No habitual accuracy of observation or statement.*—Since the United States went to war with Germany there has been an extraordinary exhibition of the incapacity of the American people as a whole to judge evidence, to determine facts, and even to discriminate between facts and fancies. This incapacity appears in the public press, in the prophecies of prominent administrative officials, both State and National, in the exhortations of the numerous commissions which are undertaking to guide American business and philanthropy, and in the almost universal acceptance by the people at large, day by day, of statements which have no foundation, and of arguments the premises of which are not facts or events, but only hopes and guesses. It is a matter of everyday experience that most Americans can not observe with accuracy, repeat correctly a conversation, describe accurately what they have themselves seen or heard, or write out on the spot a correct account of a transaction they have just witnessed. These incapacities are exhibited just as much by highly educated Americans as they are by the uneducated, especially if the defects of their education have not been remedied in part by their professional experience. The physician, the surgeon, and the public health officer often escape these defects, because their whole professional training and experience develop in them keen powers of observation and reasoning, powers which must be generally accurate and trustworthy if professional success has been attained. Some men whose education ceased at 14 acquire, through experience in their trade, powers of observation and correct inference which professional men whose education was continued to their twenty-fifth year never acquire. It is the men who have learned, probably out of school, to see and hear correctly and to reason cautiously from facts observed, that carry on the great industries of the country and make possible great transportation systems and international commerce.

Eight years ago Mr. George G. Crocker, a lawyer who had been for several years chairman of the Boston Rapid Transit Commission, and in that capacity had been much interested in law suits which grew out of accidents in the tunnels under construction, contrived

an instructive experiment on the accuracy of the testimony of bystanders. He invited 20 highly-educated gentlemen, all of whom had been successful in their several callings, to witness a brief scene enacted close to them by four actors in about one minute, and to write out immediately, each for himself, a description of what he had seen and heard. Of the 20 witnesses 3 did not attempt to write out what they had just seen and heard at close quarters. Of the other 17 no two agreed as to what happened before them, and no one gave a description which was even approximately correct. The group contained 1 judge, 1 civil engineer, 4 business men (active), 3 business men (retired), and 11 lawyers. Whoever will try a few analogous experiments on groups of his acquaintances will soon learn to distrust all tales which have passed from probably inaccurate mouth to inaccurate ear and on through a series of incompetent transmitters.

The remedies.—The remedies for the evils described in paragraphs 10 and 11 have already been worked out in a few schools and in the elective courses of some colleges and universities. It remains to apply these remedies universally in all the schools of the United States. These remedies are the substitution of teaching by observation and experiment for much of the book work now almost exclusively relied on; the cultivation in the pupils of activity of body and mind during all school time—an activity which finds delight in the exercise of the senses and of the powers of expression in speech and writing; the insistence on the acquisition of personal skill of some sort; the stimulation in every pupil of interest in his work by making the object of it intelligible to him, whether that object be material or spiritual; the inspiration in every child of tastes and sensibilities which he can use to promote actually his present enjoyment and therefore in all probability his future happiness; and finally the persistent teaching of every pupil how facts are got at in common life, how to make an accurate record of observed facts, and how to draw safe inferences from well-recorded facts. Every boy and girl in school should learn by experience how hard it is to repeat accurately one short sentence just listened to, to describe correctly the colors on a bird, the shape of a leaf, or the design on a nickel. Every child should have had during its school life innumerable lessons in mental truth-seeking and truth-telling. As things now are, comparatively few children have any direct lessons in either process.

It is for the colleges and universities of the country to lead the way in working out these serious changes in the prevailing methods of American elementary and secondary schools. It will not be possible to bring them to pass immediately in American public schools because it will be found necessary to provide on a large scale a new sort of teacher for the free schools, and much new apparatus. The important point of attack, therefore, in the promotion of this reform must be the normal school, although there will doubtless be found some teachers already in service who will gladly promote the adoption of the new methods. Finally, the successful adoption of the new methods will not involve the exclusion of book work, the ceasing to cultivate literary and artistic taste, or the reduction of the teaching of history, biography, and the fine arts. Reading, writing, spelling, and ciphering will be learned better than ever, because seen to be means to ends desired, and used every day as such.

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